MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

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FINAL EXAMINATION

TRIMESTER 1, 2019/2020

BKC2044 – KNOWLEDGE COMMERCE

(All sections / Groups)

18 OCTOBER 2019
3:00 p.m. – 5:00 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This Question paper consists of 3 pages with 5 Questions only.
2. Attempt **ALL** questions in Section A and B. The distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

SECTION A: Case Study

WILL ROBOTS REPLACE PEOPLE IN MANUFACTURING

Robots have been muscling their way into almost every single occupation. Will they eventually replace people? Not likely, even in manufacturing, where they have made the greatest inroads so far. Industrial robots with mechanical arms that can be programmed to weld, paint, and pick up and place objects with predictable regularity have not taken many tasks performed by humans on manufacturing assembly lines in Europe, Japan, the United States, and China. The biggest users of robotic technology have been automobile manufacturing plants, where robots do heavy lifting, welding, applying glue, and painting. People still do most of the final assembly of cars, especially when installing small parts or wiring that needs to be guided into place.

For most manufacturing works, it has been less expensive to use manual labor than it is to own, operate, and maintain a robotics system, given the tasks that robots can perform. But this is changing. Robots have become smaller, more mobile, more collaborative, and more adaptable, and their uses are widening. New robot models can work alongside humans without endangering them and help assemble all types of objects, as large as aircraft engines and as small and delicate as smart phones. They can also sense whether parts are being assembled correctly.

Robots are becoming easier to operate. Companies no longer need a software engineer to write program code to get a robot to perform a task. With some of today's robots, you can simply push a button, turn the robot's arm, and move it through the operation you want it to perform. The robot learns by doing.

A Renault SA plain in Cleon, France, now uses robots made by Universal Robots AS of Denmark to drive screws into engines, especially those that go into places people find hard to access. The robots have reach of more than 50 inches and six rotating joints to do the work. They also verify that parts are properly fastened and check to make sure the correct part is being used. The Renault robots weigh only about 64 pounds each, so they can easily be moved around to different locations as needed. They are also "collaborative", designed to work in proximity to people. Using sonar, cameras, or other technologies, these robots can sense where people are and slow down or stop to avoid hurting them.

These new-style robots are moving into other industries as well. ASEA Brown Boveri Ltd of Switzerland and others have recently introduced robots to help assemble consumer-electronics items. The robots were designed to work close to people and handle small parts. JCB Laboratories is using robots at its Wichita, Kansas plant to pick up syringes, fill them with medications, and snap on caps. The robots work five to six times faster than people.

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This new generation of robots will bring changes to the factory floor and perhaps the global competitive landscape. The Boston Consulting Group predicts that by 2025 the share of tasks performed by robots will rise from a global average of about 10 percent across all manufacturing industries to about 25 percent. In some industries, robots could perform more than 40 percent across all manufacturing tasks. There will be dramatic productivity gains in many industries around the world (potentially boosting output per worker by 30 percent) and shifts in competitiveness among manufacturing countries.

Does this mean that robots will take over the production line? Not at this point. They still lack the flexibility, delicacy, and insight provided by humans. For example, today's collaborative robots often have to slow down or stop whenever people veer into their paths, disrupting production. Sales have been disappointing for Baxter, a two-armed collaborative robot from Rethink, which is used primarily for simple tasks such as moving materials, picking up parts, and packing or unpacking boxes. The robot's speed is restricted by safety considerations. For all their recent advances, robots still can't duplicate a human being's fine motor skills in manipulating materials and small parts. Robots still have trouble dealing with soft or floppy material, such as cloth or bundles of electrical wire.

Although robots are good at reliably and repeatedly performing defined tasks, they're not yet good at adapting. Mercedes-Benz had to cut back on it use of robots on the production line because the level of customization demanded by its customers requires a level of flexibility and dexterity that only humans can provide. Today's Mercedes customer wants to configure his or her own car, choosing among customization options such as carbon - fiber trim, four types of tire valve caps, and heated and cooled cup holders for 30 different models. Robots can't deal with the amount of variation in options that Mercedes cars have today.

Mercedes has found that if manufacturing focuses around a skilled crew of workers, it can shift a production line in a weekend. It would take weeks to reprogram robots and shift assembly patterns, and during that downtime, production would be at a standstill. Going forward, robots won't completely disappear from the Mercedes factory floor, but they'll be smaller and more flexible, operating alongside human workers.

As robots become more widespread, manufacturing tasks performed by humans will become higher-level and more complex. Workers will be expected to supervise and perhaps even program robots, and there will be fewer low-level manufacturing jobs. Workers will need more sophisticated skills to succeed in tomorrow's manufacturing plants.

Sources: Jack Hough, "Rise of the Robots," Barrons, March 4, 2017; Bloomberg, " Why Mercedes Is Halting Robots' Reign on the Production Line," Industry Week, February 25, 2016.

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1. (a) Discuss why robots are used in manufacturing? (10 marks)

   (b) Identify and discuss **FIVE (5)** types of knowledge a roboticist requires? (10 marks)

   (Total: 20 marks)

2. (a) In your opinion, can robots replace human workers in manufacturing? Justify your answer with proper arguments. (5 marks)

   (b) List **FIVE (5)** advantages of substituting human with robot. (20 marks)

   (Total: 25 marks)

3. If you were considering introducing robots in your manufacturing plant, what issues on people, organisation and technology you need to address?

   (15 marks)

   (Total: 60 marks)

SECTION B: Structured Questions

1. Define the **SEVEN (7)** types of Strategic Levers with key activities and give an example of each lever.

   (20 marks)

2. To make a sustainable business, it is important to have good ideas in commercializing knowledge effectively. Explain FIVE (5) stages of knowledge commercialization for a successful knowledge business?

   (20 marks)

   (Total: 40 marks)

End of Paper